Code No: **R42031** **R10** **Set No. 1**

IV B.Tech II Semester Regular Examinations, April/May - 2014

INTERACTIVE COMPUTER GRAPHICS

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any Five Questions

All Questions carry equal marks

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1 a) Explain the applications of computer graphics in the area of image processing. [5]
b) Discuss in detail the Raster scan systems and also compare it with Random-scan systems. [10]

2 a) List the steps required to plot a line whose slope is between 0 to 45^o using Bresenham's method. [9]
b) What are the merits and demerits of flood-fill and scan-line algorithms? [6]

3 a) Distinguish between Cohen-Sutherland out code and Sutherland-Hodgeman algorithm. [8]
b) Explain Cyrus-beck line clipping algorithm with an example. [7]

4 a) Explain the properties of B spline. How it is differ from Bezier? [8]
b) Explain Wireframe models. Also briefly explain constructive solid geometry (CSG). [7]

5 a) How does ambient light source differ from a point light source or a parallel beam of light? [6]
b) Make a comparison of shading algorithms. [9]

6 a) Explain the scan line method for visible surface detection with an example. [9]
b) What are the merits and demerits of z-buffer? [6]

7 Explain the steps in design of animation sequence in detail with an example. [15]

8 a) What is multimedia? List the properties of multimedia systems. [3]
b) List the main attribute, benefits and drawbacks of 3 types of multimedia authoring tools. [12]

Code No: **R42031** **R10** **Set No. 2**

IV B.Tech II Semester Regular Examinations, April/May - 2014

INTERACTIVE COMPUTER GRAPHICS

(Mechanical Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks

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1 a) Explain the applications of computer graphics in the area of Education and training. [5]
b) List and explain the operating characteristics of
(i) Raster refresh systems
(ii) Vector refresh systems [10]

2 a) List the steps required to scan-convert a circle using mid-point circle algorithm [7]
b) Using Bresenham's algorithm, generate the intermediate points of the line segment, if the two end-points are given as (30,18) and (20,10). [8]

3 Explain the Cohen-Sutherland algorithm for finding the category of a line segment. Show clearly how each category is handled by the algorithm. [15]

4 a) Explain in detail the Solid Geometry (CSG). [7]
b) Mention the steps involved in Bezier's method for curve generation. [8]

5 a) Explain the illumination model consisting of different parallel beam of light source and ambient light source. What is the effect of specular reflection? [8]
b) Describe Gouraud Shading with an example. [7]

6 a) Show how the calculations of the intersection of an edge with a scan line can be made incremental as opposed to absolute. [8]
b) Implement the depth-buffer method to display the visible surfaces of a given polyhedron. [7]

7 a) Briefly explain the characteristics of each of categories of animation languages. [9]
b) Explain the mechanism followed for tracking live action in animated scenes. [6]

8 a) Suggest with reasons 5 potential applications of multimedia other than the applications in the field of entertainment and education [8]
b) Briefly describe icon-based authoring tools. [7]

Code No: **R42031** **R10** **Set No. 3**

IV B.Tech II Semester Regular Examinations, April/May - 2014

INTERACTIVE COMPUTER GRAPHICS

(Mechanical Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions

All Questions carry equal marks

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1	a)	Discuss various graphics monitors and work stations.	[7]
	b)	Assuming that a certain full-color (24-bit per pixel) RGB raster system has a 512 by 512 frame buffer, how many distinct color choices (intensity levels) would be available.	[8]
2	a)	List the steps required to fill a region using the boundary-fill method.	[7]
	b)	Generate the intermediate points on the line segment with end-points (20,10) and (30,18) using DDA algorithm.	[8]
3	a)	Explain the steps involved in Cohen-Sutherland algorithm for line clipping with an example.	[10]
	b)	Express window-to-viewport mapping in the form of a composite transformation matrix.	[5]
4		List some solid representation methods. Explain any three models in detail.	[15]
5	a)	Discuss the effect of parallel beam and a point light source on the shadow of any object with an example.	[8]
	b)	Explain Constant intensity shading algorithm.	[7]
6	a)	Explain the Back face detection method for hidden surface removal with an example.	[9]
	b)	How the storage requirements for the depth buffer can be determined from the definition of the objects to be displayed?	[6]
7	a)	What are the various types of interpolation used in animation? Explain.	[8]
	b)	Give a brief note on the methods of controlling animation.	[7]
8	a)	Write short notes on multimedia system architecture.	[7]
	b)	Briefly describe Object-oriented authoring tools.	[8]

Code No: **R42031** **R10** **Set No. 4**

IV B.Tech II Semester Regular Examinations, April/May - 2014

INTERACTIVE COMPUTER GRAPHICS

(Mechanical Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions

All Questions carry equal marks

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1 With suitable diagrams explain the construction of the following devices and their operating characteristics
(a) Raster- refresh devices
(b) Vector- refresh devices. [15]

2 a) List the steps required to fill a region using the flood-fill method. [7]
b) Draw the flow chart for Bresenham's incremental circle algorithm in the first octant. [8]

3 a) Draw a flowchart illustrating the logic of Sutherland-Hodgman algorithm. [8]
b) Find the window-to-viewport transformation that maps a window whose left corner is at (1,1) and upper right corner is at (5,5) on to a viewport that has lower left corner at (0,0) and upper right corner at (1/2,1/2). [7]

4 a) What is a spline? Explain the different ways of specifying spline curve? [8]
b) Define B-Spline curve. What are the important properties of Bezier Curve? Explain. [7]

5 a) Describe the steps involved in rendering a polygon surface mesh using Phong shading. [8]
b) Explain the different regions of a shadow formed by an extended light source. [7]

6 a) Write an algorithm to display the visible surfaces of a convex polyhedron using the depth-sort (painter's) algorithm. [8]
b) What is meant by edge coherence? What is its significance in depth-buffer algorithm? [7]

7 Illustrate the features of animation language key frame systems with suitable examples. [15]

8 a) List the applications of Multimedia. Explain them briefly. [8]
b) Briefly describe Time-based and presentation tools. [7]